WHAT IS CLAIMED IS:

1. A shim adapted for altering a magnetic field of a magnet, the shim comprising a first material which exhibits an increase in spontaneous magnetization with an increase in temperature for a predetermined temperature range.

2. The shim of claim 1, wherein the first material comprises a ferrimagnetic material.

3. The shim of claim 2, wherein said ferrimagnetic material comprises an intermetallic compound represented by the formula R_aM_b wherein R is selected from the group consisting of rare-earth elements and M is selected from the group consisting of 3d transition elements, and a and b are numbers.

4. The shim of claim 3, wherein the intermetallic compound comprises R_2M_{17}, where R comprises at least 90 atomic percent of a rare earth element selected from at least one of Dy, Sm, Tm, Er, Ho, Tb and Gd, and M comprises at least 90 atomic percent Co.

5. The shim of claim 4, wherein the intermetallic compound comprises Dy_2Co_{17}.

6. The shim of claim 3, wherein the intermetallic compound comprises RM_2, where R comprises at least 90 atomic percent of Er or Tm, and M comprises at least 90 atomic percent Fe.

7. The shim of claim 6, wherein the intermetallic compound comprises $TmFe_2$.

8. The shim of claim 3, wherein the intermetallic compound comprises RM_2, where R comprises at least 90 atomic percent of Er, Ho or Gd, and M comprises at least 90 atomic percent Fe.

9. The shim of claim 8, wherein the intermetallic compound comprises $ErFe_3$.

10. The shim of claim 3, the intermetallic compound comprises RM_{5+x} or R_6M_{23}.

11. The shim of claim 3, wherein M consists essentially of Co or Fe.

12. The shim of claim 11, wherein R comprises two or more rare earth elements.

13. The shim of claim 12, wherein intermetallic compound comprises $Gd_{1-x}Th_xFe_3$, where x is greater than zero and less than one.

14. The shim of claim 1, wherein said first material comprises a spinel compound having a formula $(A,D)_3E_4$, where A and D comprise at least two different metal elements and E consists essentially of oxygen.

15. The shim of claim 14, wherein the spinel compound comprises $Li_{0.5}Cr_aFe_{2.5-a}O_4$, where a ranges from 0.9 to 1.8, or $NiFe_{2-x}V_xO_4$, where x ranges from 0.6 to 0.69.

16. The shim of claim 1, wherein said first material comprises a garnet crystal structure represented by the formula $R_3M_5O_{12}$ wherein R comprises 40 to 100 atomic percent of at least one element selected from the group consisting of Gd, Tb, Dy, Ho, Lu, Er, Yb, and Tm, and M comprises 90 to 100 atomic percent of Fe.

17. The shim of claim 16, wherein the first material is selected from $Gd_3Fe_5O_{12}$, $(Gd, Bi)_3Fe_5O_{12}$, $Tb_3Fe_5O_{12}$, $Tm_3Fe_5O_{12}$ and $Er_3Fe_5O_{12}$.

18. The shim of claim 1, wherein said shim comprises a composite shim comprising said first material and a ferromagnetic material.

19. The shim of claim 18, wherein the composite shim comprises first material powder and ferromagnetic material powder contained in a binder.

20. The shim of claim 19, wherein the ferromagnetic material comprises iron or a cobalt iron alloy.

21. The shim of claim 19, wherein:

the ferromagnetic material comprises soft iron; and

the composite shim comprises at least 80 volume percent of ferromagnetic material powder and first material powder and 20 volume percent or less binder.

22. The shim of claim 18, wherein the ratio of the first material to the ferromagnetic material in the composite shim is selected such that the first material compensates a loss of magnetization in the ferromagnetic material with an increasing temperature.

23. The shim of claim 22, wherein:

the predetermined temperature range includes at least a range of 298 K to 400K; and

the composite shim exhibits substantially no change in spontaneous magnetization with at least a 25 degree K increase in temperature in a predetermined temperature range.

24. The shim of claim 1, wherein the shim is located in a shim element.

25. The shim of claim 24, wherein the shim element having a structure selected from the group consisting of composite, cladded, laminated, filament, wire, coil, strip, foil, slab, and stack.

26. An imaging system, comprising:

a magnet; and

the shim element of claim 25 located between the magnet and an imaging volume of the imaging system.

27. The system of claim 26, wherein:

the system comprises an MRI system; and

the magnet comprises a superconductive or permanent magnet.

28. An indicating, recording or measuring device comprising a magnet and the shim of claim 1 located adjacent to the magnet.

29. A motor or generator, comprising:

a rotor;

a stator;

a magnet located in one of the rotor and stator; and

the shim of claim 1 located in the magnetic field of the magnet.

30. A method for altering a magnetic field of a magnet, said method comprising disposing a shim within said magnetic field, wherein the shim comprises a first material which exhibits an increase in spontaneous magnetization with an increase in temperature for a predetermined temperature range.

31. The method of claim 30, wherein the first material comprises a ferrimagnetic material.

32. The method of claim 31, wherein said ferrimagnetic material comprises an intermetallic compound represented by the formula R_aM_b wherein R is selected from the group consisting of rare-earth elements and M is selected from the group consisting of 3d transition elements, and a and b are numbers.

33. The method claim 32, wherein the intermetallic compound comprises R_2M_{17}, where R comprises at least 90 atomic percent of a rare earth element selected from at least one of Dy, Sm, Tm, Er, Ho, Tb and Gd, and M comprises at least 90 atomic percent Co.

34. The method of claim 33, wherein the intermetallic compound comprises Dy_2Co_{17}.

35. The method of claim 30, wherein said shim comprises a composite shim comprising said first material and a ferromagnetic material.

36. The method of claim 35, wherein the predetermined temperature range includes at least a range of 298 K to 400K.

37. The method of claim 36, further comprising increasing the temperature of the composite shim within the predetermined temperature range while the composite shim exhibits substantially no change in spontaneous magnetization with an increase in temperature in the predetermined temperature range.

38. The method of claim 35, wherein the shim is located in a magnetic resonance imaging system.

39. The method of claim 30, wherein the shim is located in a permanent magnet of a magnetic resonance imaging system.

40. The method of claim 39, wherein the magnetic field of the permanent magnet exhibits substantially no change with an increase in temperature from 298K to 338K.

41. A magnet comprising a ferromagnetic material and a ferrimagnetic material which exhibits an increase in spontaneous magnetization with an increase in temperature for a predetermined temperature range.

42. The magnet of claim 41, wherein said ferromagnetic material comprises a permanent magnet material; and the magnet emits a magnetic field which exhibits substantially no change with an increase in temperature from 298K to 338K.

43. The magnet of claim 42, wherein the magnet comprises a bonded magnet.

44. The magnet of claim 43, wherein the ferromagnetic material comprises a rare earth-iron-boron alloy and the ferrimagnetic material comprises a rare earth transition metal alloy.

45. A method for making a magnetic device comprising:

a. providing a ferromagnetic material;

b. providing a binder;

c. providing a ferrimagnetic material which exhibits an increase in spontaneous magnetization with an increase in temperature for a predetermined temperature range; and

d. forming said ferromagnetic material, said binder, and said ferrimagnetic material into a composite having a desired shape and dimension to produce said magnetic device.

46. The method of claim 45, wherein the magnetic device is disposed within a magnetic field of a magnet.

47. The method of claim 46, wherein the ferrimagnetic material exhibits an increase in spontaneous magnetization with an increase in temperature for a temperature range including at least a range of 298 K to 400K.

48. The method of claim 47, wherein said ferrimagnetic material comprises an intermetallic compound represented by the formula R_aM_b wherein R is selected from the group consisting of rare-earth elements and M is selected from the group consisting of 3d transition elements, and a and b are numbers.

49. The method of claim 48, wherein the intermetallic compound comprises R_2M_{17}, where R comprises at least 90 atomic percent of a rare earth element selected from at least one of Dy, Sm, Tm, Er, Ho, Tb and Gd, and M comprises at least 90 atomic percent Co.

50. The method of claim 49, wherein:

the ferromagnetic material comprises soft iron, hard iron or an iron cobalt alloy; and

the intermetallic compound comprises Dy_2Co_{17}.

51. The method of claim 46, wherein magnetic device is located in a magnetic resonance imaging system.

52. A magnetic resonance imaging system comprising a primary magnet and a shim assembly, said shim assembly comprising a ferromagnetic and a ferrimagnetic material which exhibits an increase in spontaneous magnetization with an increase in temperature for a predetermined temperature range, wherein said shim assembly is capable of altering a magnetic field generated by said primary magnet.

53. The system of claim 52, wherein said shim assembly is capable of altering a magnetic field generated by said primary magnet such that the magnetic field remains substantially constant with an increase in temperature.

54. The system of claim 52, wherein said ferrimagnetic material comprises an intermetallic compound represented by the formula R_aM_b wherein R is selected from the group consisting of rare-earth elements and M is selected from the group consisting of 3d transition elements, and a and b are numbers.

55. The system of claim 54, wherein:

the ferrimagnetic material comprises R_2M_{17}, where R comprises at least 90 atomic percent of a rare earth element selected from at least one of Dy, Sm, Tm, Er, Ho, Tb and Gd, and M comprises at least 90 atomic percent Co; and

the ferromagnetic material comprises iron or an iron cobalt alloy.

56. The system of claim 55, wherein the ferrimagnetic material comprises Dy_2Co_{17} powder and the ferromagnetic material comprises soft iron powder.

57. The system of claim 52, wherein the shim assembly comprises ferrimagnetic material powder and the ferromagnetic material powder contained in a binder.

58. The system of claim 52, wherein the ratio of the ferrimagnetic material to the ferromagnetic material in the shim assembly is selected such that the ferrimagnetic material compensates a loss of magnetization in the ferromagnetic material with an increasing temperature in a predetermined temperature range.

59. The system of claim 58, wherein:

the predetermined temperature range includes at least a range of 298 K to 400K; and

the shim assembly exhibits substantially no change in spontaneous magnetization with at least a 25 degree K increase in temperature in the predetermined temperature range.

60. The system of claim 59, wherein the shim assembly has a structure selected from the group consisting of composite, cladded, laminated, filament, wire, coil, strip, foil, slab, and stack.